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EP 0 000313

4/3,AB,LS/1
DIALOG(R)File 351:Derwent WPI

002083091
WPI Acc No: 1979-A2976B/ 197902
Aerosol container spray pump - has pressurising chamber from which liq. is displaced to outlet chamber with diaphragm to open outlet above predetermined pressure
Patent Assignee: NORMOS N (NORM-I)
Inventor: NORMOS N
Number of Countries: 006 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 313	A	19790110				197902	B
FR 2396182	A	19790302				197914	

Priority Applications (No Type Date): FR 7720250 A 19770701
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 313	A				

Designated States (Regional): BE CH DE GB NL

Abstract (Basic): EP 313 A

The liquid atomising pump includes a hollow body (1) containing a diffuser (28) with a blocking element (36) which is displaceable towards the ilet (13). The orifice (34) opens into a chamber (52) defined between the diffuser and a flexible membrane (24) coupled to a plunger (20).

The latter defines a compartment (65) and a compression chamber (56) which communicates with chamber (52) via a passage (38). The plunger is also coupled to the blocking element (36) is housed by a spring such that beyond a given liquid pressure, threshold, the membrane is displaceable towards the inlet to displace the blocking element from the outlet orifice (34).

Assembly may be used in an aerosol container, the spray produced being easily controllable since it functions using an accumulated volume of liquid in an axially expandible chamber.

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number
WO 01/24766 A1

(51) International Patent Classification[7]: A61K 7/00, 7/32, 7/34, 7/38

(21) International Application Number: PCT/EP00/09144

(22) International Filing Date:
18 September 2000 (18.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/157,382 1 October 1999 (01.10.1999) US

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(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*
— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/24766 A1

(54) Title: ANTIPERSPIRANT COMPOSITIONS COMPRISING MICROEMULSIONS

(57) Abstract: Stable, clear, antiperspirant microemulsions containing cosmetic oils, antiperspirant salts, and water and combinations of cationic quaternary ammonium salt are provided. These microemulsions can be used in different types of applicators such as roll-on, sponge, mousse, pad, brush, gel and aerosol or non-aerosol spray applicators.

ANTIPERSPIRANT COMPOSITIONS COMPRISING MICROEMULSIONS

Field of the Invention

This invention is related to microemulsions that contain cosmetically active ingredients. In a preferred embodiment, this invention is related to antiperspirant salt-containing microemulsions that are stable, clear liquids and are easy and inexpensive to produce.

Background of the Invention

The microemulsions of the present invention contain water. Microemulsions of the present invention are transparent or translucent, optically isotropic and thermodynamically stable mixtures of oil and water stabilized by surfactants and perhaps co-surfactants. The particle size of the dispersed phase of a microemulsion is about 100 to about 2000 angstroms, more preferably are about 100 to about 1000 angstroms. They can form spontaneously or with a little energy. Therefore they are simple to prepare and are not process dependent i.e. the order of addition of starting materials or speed / type of mixing is not critical to the preparation of the microemulsions. It would be desirable to formulate antiperspirant compositions using microemulsions because microemulsions are easy and inexpensive to process and can be inherently clear without

requiring refractive index matching of the aqueous and non-aqueous phases.

Microemulsions have attracted considerable technological and scientific interest. Water-in-oil (w/o) microemulsions containing water, an ionic surfactant, a cosurfactant and oil are the most investigated. The ionic surfactant- containing microemulsions usually exhibit stability over a large range of temperature. . When inorganic salts are added, the minimum surfactant level to form water-in-oil microemulsions will increase. As the hydrocarbon oil chain length increases, the solubilization of aqueous phase into the oil phase decreases, while the liquid crystal area increases. Nonionic surfactant-containing water-in-oil microemulsions require a large amount of surfactant as well. Unfortunately, nonionic surfactant-containing microemulsions commonly exhibit a small temperature range of stability

Microemulsions exist in the following forms: as water-in-oil, oil-in-water or as a *bicontinuous phase*, which is also called the *surfactant phase*. As used herein, the term "microemulsion means water-in-oil, oil-in-water or a bicontinuous phase, or mixtures thereof. Bicontinuous phase microemulsions are found to solubilize a high amount of water and oil with lower levels of surfactant. The region around a bicontinuous phase microemulsion may transition into a swollen lamellar phase, otherwise known as a liquid crystal phase, and in certain cases these phases (microemulsion and liquid crystal) may co-exist. These phases exhibit birefringence, shear induced (streaming)

birefringence, and are thixotropic, viscoelastic and transparent. Because some of these systems exhibit increased viscosity the technical literature may refer to them as microemulsion gels.

It is an object of the present invention to provide antiperspirant compositions, which contain high levels of antiperspirant salts, cosmetic oils and surfactants suitable for application to the axilla. It is also an object of the present invention to provide antiperspirant compositions that do not require refractive index matching of the aqueous and nonaqueous phases in order to be clear. It is also an object of the present invention to provide microemulsion antipersprirant compositions that require little energy to manufacture. These and other objects of the present invention will become more readily apparent in the present application.

Patents and patent documents, which are cited in connection with the disclosed invention, are as follows:

DE 196 42 090 A1 discloses cosmetic or dermatologic compositions based on microemulsions.

U.S. Patent 5,162,378 discloses water in oil microemulsions comprising cetyl dimethicone copolyol, water, silicone, alcohol, and 5-40% by weight of one or more salts.

U.S. Patent 5,705,562 discloses a method of spontaneously forming a highly stable clear microemulsion by combining water, a volatile cyclic methyl siloxane or a

volatile linear methyl siloxane and a silicone polyether surfactant. U.S Patent 5,707,613 is in the same patent family as the just mentioned patent.

WO 94/22420 is concerned with silicone-based skin care products, which are applied to the skin as aerosols and form a clear gel on the skin.

WO 94/19000 discloses pharmaceutical compositions in the form of a microemulsion which comprise and oil, a mixture of high and low HLB surfactants in which the high HLB surfactant comprises an aliphatic, aryl or aliphatic-aryl sulfate or sulfosuccinate or salt thereof, an aqueous phase and a biologically active agent.

WO 94/08610 discloses pharmaceutical compositions in the form of microemulsions which comprise an oil, a mixture of high and low HLB surfactants in which the high HLB surfactant comprises a medium-chain fatty acid salt, an aqueous phase and a biologically active agent.

U.S. 5,575,990 discloses roll-on antiperspirant compositions which are clear and, when applied to the human skin, do not leave a visible white residue after drying. The clear antiperspirant roll-on compositions are stable under varying temperature conditions and provide a suitable cosmetically acceptable feel or sensation when applied to the human skin.

U.S. 5,487,887 discloses roll-on antiperspirant compositions and more particularly concerns antiperspirant

compositions which are clear and stable under varying temperature conditions and, when applied to the human skin, do not leave a visible white residue after drying. The compositions in the form of an oil-in-water microemulsion, comprise an antiperspirant active 5-30, PEG-7-glyceryl cocoate 5-25, emollients 0.5-3, cyclomethicone 3-7, and water 53-60%.

Summary of the Invention

The invention relates to a composition in the form of a microemulsion comprising an antiperspirant salt, a cosmetic oil, and a combination of at least one cationic quaternary surfactant and at least one nonionic surfactant.

Detailed Description of the Invention

The present invention is directed to antiperspirant salt-containing microemulsions that are stable and clear liquids, or clear antiperspirant gels.

Stable clear microemulsions containing cosmetic oils, antiperspirant salt, water, quaternary surfactants and nonionic surfactants have been discovered. The microemulsions are primarily composed of bicontinous phase but the compositions include water-in-oil, oil-in-water, and microemulsion gels (liquid crystals). The microemulsions are novel antiperspirant compositions that can be used in different types of applicators such as roll-on, sponge,

mousse, pad, wipe, brush, gel and aerosol or non-aerosol spray applicators.

The microemulsions discovered in this invention contain inorganic salts such as antiperspirant salts and cosmetic oils and the solubilization of high levels of both oil and aqueous solution of salts is achieved by incorporating combinations of a quaternary ammonium surfactant and a nonionic surfactant.

More specifically, the invention relates to a composition in the form of a microemulsion comprising an antiperspirant salt, cosmetic oils, and a combination of at least one cationic quaternary surfactant and at least one nonionic surfactant.

The invention also relates to a method for controlling or preventing underarm perspiration and malodor, which comprises applying to the underarm area a composition according to the invention.

The characteristics of the microemulsions of this invention include one or more of:

- The microemulsions exhibit stability over a relatively large range of temperature.
- The viscosity ranges from a thick gel to a low viscosity sprayable liquid.
- The types of the microemulsions formed are dependent on the ratio of aqueous phase to the nonionic surfactant(s) and oil. When the percentage of the salt solution

containing quaternary surfactant increases, the microemulsion changes from water-in-oil to oil-in-water type, and a bicontinuous microemulsion phase, or possibly a liquid crystal phase, will form in-between.

- The microemulsions can contain a high level of inorganic salts.
- The microemulsions contain a quaternary surfactant and a nonionic surfactant.
- The microemulsions contain cosmetically acceptable oils.
- A method for controlling or preventing underarm perspiration and malodor, which can be applied to the underarm area.
- The application of the microemulsions can be accomplished by using various product dispensers.

As used herein % means weight percent unless otherwise specified.

As used herein the term cationic surfactant means quaternary ammonium surfactant.

The starting materials set forth herein are either known or can be prepared according to known methods. The compositions of the invention can be made by known methods or by methods that are analogous to known methods.

As used herein, microemulsions mean stable clear microemulsions containing cosmetic oil; antiperspirant salts, water and surfactants. The microemulsions described herein are primarily composed of bicontinous phase but the

compositions can include water-in-oil microemulsions. The compositions of the invention can also comprise a liquid crystal (that is, a microemulsion gel). More specifically, the compositions of the invention are selected from the group consisting of a microemulsion, a liquid crystal (that is, microemulsion gel), or a mixture of a microemulsion and a liquid crystal. The compositions of the invention comprise an antiperspirant salt, a cosmetic oil, and a combination of at least one cationic quaternary surfactant and at least one nonionic surfactant.

The compositions of the invention are novel antiperspirant compositions that can be used in different types of applicators such as roll-on, sponge, mousse, pad, brush, wipe, gel and aerosol or non-aerosol spray applicators.

All of the microemulsion compositions described contain antiperspirant salts and are clear and stable over a larger temperature range from room temperature to 45°C-50°C. The viscosity of some of the water-in-oil microemulsions are less than 10cst, therefore they are spray-able.

The invention relates to a composition in the form of a microemulsion comprising an antiperspirant salt, cosmetic oils, and a combination of at least one cationic quaternary surfactant and at least one nonionic surfactant.

A description of the ingredients included in the compositions of the invention now follows.

Antiperspirant Salts

Antiperspirant salts contained in these microemulsions include, but are not limited to, aluminum chlorohydrate, aluminum dichlorohydrate, aluminum sesquichlorohydrate, aluminum chlorohydrex propylene glycol complex, aluminum dichlorohydrex propylene glycol complex, aluminum sesquichlorohydrex propylene glycol complex, aluminum chlorohydrex polyethylene glycol complex, aluminum dichlorohydrex polyethylene glycol complex, aluminum sesquichlorohydrex polyethylene glycol complex, aluminum zirconium trichlorohydrate, aluminum zirconium tetrachlorohydrate, aluminum zirconium pentachlorohydrate, aluminum zirconium octachlorohydrate, aluminum zirconium trichlorohydrex glycine complex, aluminum zirconium tetrachlorohydrex glycine complex, aluminum zirconium pentachlorohydrex glycine complex, aluminum zirconium octachlorohydrex glycine complex, aluminum chloride or buffered aluminum sulfate.

Antiperspirant actives for use herein are often selected from astringent active salts, including in particular aluminum, zirconium and mixed aluminum/zirconium salts, including both inorganic salts, salts with organic anions and complexes. Preferred astringent salts include aluminum, zirconium and aluminum/zirconium halides and halohydrate salts, such as chlorohydrates.

Aluminum halohydrates are usually defined by the general formula $Al_2(OH)_xQ_y$ or a hydrate thereof in which Q represents chlorine, bromine or iodine, x is variable from 2

to 5 and x+y=6 . The level of hydration is variable for example wherein there are up to about 6 or higher water molecules.

Zirconium actives can usually be represented by the empirical general formula: $ZrO(OH)_{2n-nz}B_z$ or a hydrate thereof in which z is a variable in the range of from 0.9 to 2.0 so that the value 2n-nz is zero or positive, n is the valence of B, and B is selected from the group consisting of chloride, other halide, sulphamate, sulfate and mixtures thereof. Possible hydration to a variable extent is represented by wH_2O. It is preferable that B represents chloride and the variable z lies in the range from 1.5 to 1.87. In practice, such zirconium salts are usually not employed by themselves, but as a component of a combined aluminum and zirconium-based antiperspirant. The level of hydration is variable for example wherein there are up to about 6 or higher water molecules.

The above aluminum and zirconium salts may have coordinated and/or bound water in various quantities and/or may be present as polymeric species, mixtures or complexes. In particular, zirconium hydroxy salts often represent a range of salts having various amounts of the hydroxy group. Zirconium aluminum chlorohydrate may be particularly preferred.

Antiperspirant complexes based on the above-mentioned astringent aluminum and/or zirconium salts can be employed. The complex often employs a compound with a carboxylate group, and advantageously this is an amino acid. Examples

of suitable amino acids include dl-tryptophan, dl-β-phenylalanine, dl-valine, dl-methionine and β-alanine, and preferably glycine, which has the formula CH_2 (NH_2) COOH.

Complexes of a combination of aluminum halohydrates and zirconium chlorohydrates with or without with amino acids such as glycine can be employed in this invention. Certain of those Al/Zr-glycine complexes are commonly called ZAG in the literature. Aluminum-Zirconium actives or ZAG actives generally contain aluminum, zirconium and chloride with an Al/Zr ratio in a range from 2 to 10, especially 2 to 6, an Al/Cl ratio from 2.1 to 0.9. ZAG actives also contain a variable amount of glycine. In certain conditions, salts with an Al/Zr ratio greater than 2 (also known as low-zirconium actives) may be preferred. Actives of these preferred types are available from Westwood, from Summit and from Reheis.

Other antiperspirant-salt actives that may be utilized include astringent titanium salts, for example those describe in GB 2299506A.

The proportion of solid antiperspirant salt in a composition normally includes the weight of any water of hydration and any complexing agent that may also be present in the solid active. However, when the salt is in solution, its weight excludes any water present.

The antiperspirant active will often provide from 1 to 60% by weight of the aqueous phase, particularly from 10% to 60% of the aqueous phase. The final content of the salts in

the formulations can range from 0.1% to 40% but 5-35% is preferred.

Other Aqueous Phase Ingredients

In addition to aluminum salts, the microemulsions, discovered in this invention, could solubilize aqueous solutions of monovalent, divalent and trivalent salts. The salts include sodium chloride, sodium sulfate, calcium chloride, calcium sulfate, magnesium chloride, aluminum sodium lactate, and mixtures thereof.

Other ingredients which can be dissolved in the aqueous phase include buffers, glycols, sugars, cyclodextrins, preservatives, antimicrobials, fragrances, chelating agents, amino acids, antimicrobials, anticholinergics, water-soluble polymers etc.

Water Content

The antiperspirant salts or other aqueous phase ingredients can be dissolved into water first and then combined with the non-aqueous phase. Water content in the final formulations can range from 1% to 60%, 5% to 30% is preferred and 10% to 25% is the most preferred.

Oil Phase

The oil phase of the compositions of the invention can contain cosmetic oils such as esters, ethers, long chain alcohols or ethoxylated alcohols, hydrocarbons, fatty acids,

monoglycerides, diglycerides or triglycerides, fragrances, volatile or non-volatile silicone fluids. Cholesterol and some other lipids can be incorporated with the oil phase to act as emollients. The oil phase concentration can range from 0% to 95%, but 20% to 60% is preferred.

Silicone fluids that may be included in compositions of the invention include volatile and non-volatile silicone fluids such as cyclomethicones and dimethicones.

Non-volatile silicones such as phenyl tris(trimethylsiloxy)silane can be included in compositions of the invention.

Silicone elastomers such as DC 9040, or DC 9010 by Dow Corning or GE SFE 839 by General Electric, can be included in the compositions of the invention.

Esters selected from the group consisting of cetyl octanoate, C12 -15 alcohol benzoate, isostearyl benzoate, diisopropyl adipate, isopropyl palmitate, isopropyl myristate and mixtures thereof may be included in the compositions of the invention.

Hydrocarbon oils such as aliphatic hydrocarbons (Permethyl 102A ™, Permethyl 101™); hydrogenated polybutenes; hydrogenated polydecenes (Silkflo™); dioctylcyclohexane; mineral oil, cyclohexane and mixtures thereof may be included in the compositions of the invention.

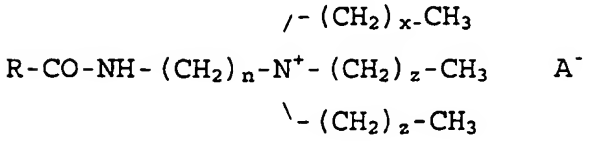
Surfactants

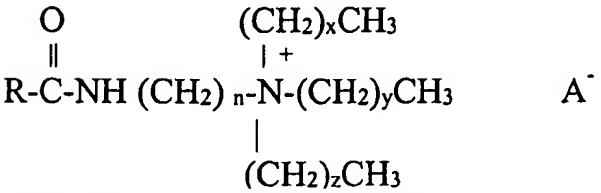
Quaternary Ammonium Surfactants

Combinations of a cationic, quaternary ammonium surfactant(s) and a nonionic surfactant are employed in the compositions of the invention.

The quaternary surfactant in this invention is essential, without which the formulation will be either extremely sensitive to temperature or a microemulsion will not form. The preferred cationic surfactants employed in compositions of the invention are alkylamidopropyl alkyldimonium quaternaries.

The preferred cationic quaternary surfactants have the following structure:-





wherein n is one to six.

x is zero to three

y is zero to three

z is zero to three

with the proviso that $x+y+z \leq 6$

A^- is any physiologically acceptable counter ion which does not adversely affect the composition, and more specifically A^- can be selected from the group consisting of chloride, bromide, ethosulfate, methyl sulfate, lactate, acetate, nitrate or sulfate.

where R is a ricinoleic derivative:

$CH_3 (CH_2)_5CH(OH) CH_2-CH=CH- (CH_2)_7-$;

or mixtures thereof.

Obviously, variations on this structure, known to the art, can also be incorporated into embodiments of this invention. The variations on surfactant structure should exhibit solubility in the aqueous antiperspirant salt solution. If the above mentioned solubility is maintained then variations in the quaternary ammonium salts can include but are not limited to, increasing or decreasing the alkyl chain length, changing the position or removal of the hydroxyl group, changing the position or removing completely the double bond or combinations thereof.

The most preferred quaternary surfactant is ricinoleamidopropyl ethyldimonium ethosulfate a compound according to the formula above wherein n=3, x=1, y=0, z=0, A^- = ethosulfate and

$R = CH_3 (CH_2)_5CH(OH) CH_2-CH=CH-(CH_2)_7-$.

The surfactant described just above is also known, under the following trade names, as Surfactol Q4 from

CasChem Inc., Lipoquat R from Lipo Chemicals or Mackernium DC-159 from McIntyre Chemical. Preferably the quaternary surfactant is supplied in a concentrated form (>90% active) with a low free amine content. This form is readily miscible with the aqueous antiperspirant-salt solution.

The quaternary surfactant(s) in the compositions of the invention range from 0.1% to 30%, where 2% to 15% is preferred.

Nonionic Surfactants

The nonionic surfactant or co-surfactants employed in the compositions of the invention can be polyethoxylated alcohol ethers or esters, polyglycerol mono or di-esters, glyceryl esters or branched guerbet ethoxylates or alcohols, or long chain carboxylic acids or combinations thereof. These compounds have a hydrophilic-lipophilic balance of between about 2 to about 15 and preferably less than about 12. Non-limiting examples are polyglycerol-3 diisostearate; glycerol oleate; poly glycerol-2 monoisostearate; polyglycerol -2 diisostearate, glyceryl isostearate. The most preferred ones are polyglyceryl-3 diisosterate, glyceryl isosterate and glycerol oleate or combinations thereof.

The ratio of cationic surfactant to aqueous phase containing antiperspirant salt ranges from 30/70 to 4/96, the ratio from 10/90 to 5/95 is preferred. The ratio of aqueous phase including salts, water and cationic surfactant

to nonionic surfactant is 90/10 to 70/30, and the ratio from 90/10 to 80/20 is preferred.

Formulation Examples

The following samples are stable for one month at room temperature. The particle size or domain length of these compositions are between about 150 to about 600 angstroms. All samples are clear. Some samples exhibit streaming birefringence. Some samples exhibit birefringence. The viscosity of these samples range from a thin liquid to a gel. These microemulsions are primarily composed of bicontinous phase but the compositions include water-in-oil, and microemulsion gels (liquid crystals).

The following formulation examples are illustrative of the invention.

The following is a general formula for an antiperspirant microemulsion of the present invention.

General Formulation Example:

Components		Specific Examples of components	Range	Preferred range
Oil Phase*		Aliphatic Hydrocarbon 90-10% Volatile Silicone 10-90%	0-95%	20-60%
Aqueous Phase*	Water	Deionized Water	1-60%	5-30%
	Antiperspirant-Salt	ACH or AZG or other salts	0.1-40%	5-35%
Non-ionic surfactant		Polyglycerol-3 diisosterate	0.2 to 30%	4-15% 5-10% most preferred
Cationic Quaternary Ammonium Surfactant		Ricinoleamidopropyl ethyl dimonium ethosulfate	0.1-30%	2-15%

*Cosmetic additives or other optional ingredients can be added to either phase as required.

Generalized manufacturing procedure:

1. Weigh all the oil phase components into a suitable vessel and mix until homogenous. Heat may be used to expedite dispersion of components solid at room temperature.

2. The aqueous phase is prepared by mixing the quaternary ammonium surfactant with the antiperspirant salt solution.
3. Add the oil and water phases together and mix until a clear, homogenous dispersion is formed.
4. The microemulsion formulation is transferred into a suitable dispenser or applicator.

The following examples more fully illustrate embodiments of this invention, all percentages being by weight unless otherwise noted. The following specific examples, which are compositions of the invention, were made.

Compositions were prepared according to the following procedure:

1. Mix the cationic surfactant with the antiperspirant salt solution
2. Mix the nonionic surfactant with the oil mixture, then add the two mixtures together and mix well.
3. Heat may be applied to better dissolve solid nonionic surfactants, which are solid such as glyceryl oleate, in the oil phase prior to mixing the aqueous and non-aqueous phases

4.

	Prisorine 3700 %	Cationic ** %	Aluminum Zirconium tetra %	Water%	DC245%	HC* %	
1	10.03	5.98	13.55	20.31	15.04	35.09	
2	8.99	4.66	10.57	15.85	17.98	41.95	
3	7.02	3.45	7.82	11.74	20.99	48.98	
4	3.97	1.73	3.93	5.91	25.34	59.12	
5	Prisorine 3700 %	Cationic ** %	ACH %	Water %	DC245%	HC * %	
6	9.97	6.78	19.2	19.2	13.45	31.40	
7	2.99	1.02	2.89	2.90	27.06	63.14	
	Glyceryl oleate %	Cationic ** %	Aluminum Zirconium tetra %	Water %	DC 245 %	HC * %	
8	14.24	11.71	22.09	33.13	5.65	13.18	
9	11.05	8.55	16.13	24.20	12.02	28.05	
10	10.02	7.89	14.88	22.33	13.46	31.42	
11	9.99	6.98	13.17	19.75	15.03	35.08	Birefringent
12	14.95	12.27	23.13	34.69	4.49	10.47	
	Glyceryl oleate %	Cationic ** %	ACH %	Water %	DC 245 %	HC * %	
13	3.99	12.91	36.57	36.57	2.99	6.97	
14	2.99	1.83	5.17	5.18	25.45	59.38	Birefringent
15	8.50	7.70	21.82	21.82	12.05	28.11	
	Prisorine 3700 %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC245%	HC * %	
16	16.64	8.67	23.2	34.8	5.01	11.68	Birefringent
17	14.12	6.04	16.17	24.25	11.83	27.59	Birefringent
18	7.46	4.87	16.30	16.29	16.52	38.56	

	Glyceryl isostearate %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	HC * %	
19	11.02	11.09	25.15	37.72	4.51	10.51	Birefringent
20	10.02	8.99	20.37	30.55	9.02	21.05	Birefringent
21	9.03	7.64	17.32	25.99	12.00	28.02	Birefringent
22	7.97	6.32	14.32	21.47	14.98	34.94	
23	6.02	3.60	8.15	12.22	21.00	49.01	
	Glyceryl isostearate %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	HC * %	
24	6.02	4.434	7.82	11.72	21.00	49.01	
25	8.52	13.64	24.03	36.05	5.33	12.43	
26	9.00	5.71	8.72	16.46	18.03	42.08	
26	4.68	0.14	0.25	0.38	28.36	66.19	
27	9.74	0.46	0.81	1.21	26.33	61.45	
	Glyceryl isostearate %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	HC * %	
28	11.47	11.80	26.76	40.13	2.95	6.89	Birefringent
29	11.11	11.07	25.10	37.65	4.52	10.55	
30	10.03	6.74	15.29	22.93	13.50	31.51	
31	9.54	6.06	13.73	20.60	15.02	35.05	
32	11.38	11.91	27.00	40.51	2.76	6.44	
	Glyceryl isostearate %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	Silkofl o 366-NF %	
33	7.45	16.94	30.34	44.66	0.43	0.18	Birefringent
34	12.36	11.88	22.40	33.59	13.85	5.92	Birefringent
35	12.06	11.92	22.47	33.71	13.89	5.95	
36	12.05	9.26	17.46	26.19	24.53	10.51	
37	10.93	7.78	14.67	22.01	31.23	13.38	

	Prisorine 3700 %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	Silkflo 366-NF %	
38	10.67	11.19	25.36	38.05	10.31	4.42	Birefringent
39	14.01	9.89	22.41	33.61	14.06	6.02	
40	4.93	2.22	5.03	7.55	56.20	24.07	
41	13.98	6.90	15.64	23.45	28.02	12.01	
42	11.51	5.77	13.08	19.62	35.02	15.00	
43	9.51	4.58	10.37	15.56	41.98	18.00	
44	7.98	3.32	7.52	11.28	48.93	20.97	
	Prisorine 3700 %	Cationic ** %	Aluminum Zirconium penta %	Water %	DC 245 %	Silkflo 366-NF %	
45	11.05	13.48	25.42	38.08	8.34	3.63	
46	12.03	11.91	22.46	33.70	13.92	5.98	
47	11.96	9.80	18.49	27.73	22.41	9.61	Birefringent
48	15.96	11.22	21.16	31.73	13.95	5.98	Birefringent
49	14.03	9.78	18.44	27.66	21.06	9.03	
	Isofol 12 alcohol ethoxylate/ cholesterol	Cationic ** %	ACH %	Water %	DC245%	HC * %	
50	20.15/0	8.21	23.26	23.26	7.52	17.60	Birefringent
51	12.71/2.44	6.72	18.85	18.85	12.12	28.31	

* HC means hydrocarbon: Permethyl 102A, listed in the above table

** Cationic means the cationic surfactant:

Ricinoleamidopropyl ethyldimonium ethosulphate

Further examples include:

Example 52

Ingredient (INCI)	Trade Names	Source	Percent
Ricinoleamidopropyl Dimonium Ethosulfate	Surfactol Q4	CasChem, Inc	7.50%
Polyglycerol-3 Diisostearate	Prisorine PG3 DI 3700	Uniqema	10%
Aliphatic Hydrocarbon	Permethyl 102A	Presperse	28%
Cyclopentasiloxane	DC245	Dow Corning	12%
Aluminum Chlorohydrate 50%	Westchlor 200	Westwood	42.50%
		Total:	100%

Example 53

Ingredient (INCI)	Trade Names	Source	Percent
Ricinoleamidopropyl Dimonium Ethosulfate	Surfactol Q4	CasChem, Inc	7.50%
Glyceryl Isostearate	Peceol Isostearique	Gattefosse	10%
Hydrogenated Polydecene	Silkflo 366	Lipo Chemicals	12%
Cyclopentasiloxane	DC245	Dow Corning	28%
Aluminum Zirconium Pentachlorohydrate 40%	Low Zirconium Penta Solution R280-130	Reheis	42.50%
		Total:	100%

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Example 54

Ingredient (INCI)	Trade Names	Source	Percent
Ricinoleamidopropyl Dimonium Ethosulfate	Surfactol Q4	CasChem, Inc	2.77%
Aluminum Zirconium Pentachlorohydrate 40%	Low Zirconium Penta Solution R280-130	Reheis	47.63%
Glyceryl Isostearate	Peceol Isostearique	Gattefosse	3.06%
Hydrogenated Polydecene	Silkflo 366	Lipo Chemicals	11.70%
Cyclopentasiloxane	DC245	Dow Corning	27.04%
Ethoxylated Guerbet Alcohol C14 / 4 EO HLB ~9	Novel II Isofol 14T+4EO	Condea Vista	7.80%
		Total:	100%

Examples 55 and 56

Ingredient (INCI)	Trade Names	Supplier	55	56
			Per-cent	Per-cent
Ricinoleamidopropyl ethyl dimonium ethosulfate	Surfactol Q4	Caschem	2.32	2.83
Aluminum zirconium penta cholorohydrate	Rezal 67	Reheis	15.94	18.13
Water	Deionized Water	Stock	23.91	27.19
Urea	Urea	Janssen Chimica	-	3.34
Cyclopentasiloxane	DC 245	Dow Corning	29.08	22.08
Polydecene hydrogenated	Silkflo366NF	Lipo Chemicals	11.62	9.46
Glyceryl isostearate	Peceol isostearique	Gattefosse	5.26	-
Polyglyceryl-3 diisostearate	Prisorine 3700	Unichema	0.87	3.49
Ethoxylated Guerbet alcohol $C_{18}EO_{10}$	Novel II I18T-10 ethoxylate	Condea Vista	3.36	6.19
2-hexyldecanol (Guerbet C16 Alcohol)	Isoflo 16	Condea Vista	7.64	7.29
		Total	100	100

Raw materials used in preparation of the example compositions of the invention are as follows:

Trade Name	Chemical Name	Vender
DC 245	Cyclomethicone D5	Dow Corning
DC 344	Cyclomethicone D4	Dow Corning
Silkflo 364 or 366	Hydrogenated Polydecene	Lipo Chemical
Permethyl 102 A	Aliphatic hydrocarbon	Permethyl Specialties
Permethyl 101	Aliphatic hydrocarbon	Permethyl Specialties
Trivent OC-16	Cetyl octanoate	Trivent Chemical Company
Cetiol S	Dioctyl cyclohexane	Henkel Corporation
Peceol Isostearique	Glyceryl isostearate	Gattefosse
Monomuls 90-018	Glycerol oleate	Henkel Corporation
Fancol Polyiso 275	Hydrogenated polyisobutene	The Fanning Corp.
Finsolve TN	C12-C15 alcohol benzoate	Finetex
Finsolve SB	Isostearyl benzoate	Finetex
Prisorine 3700	Polyglycerol -3 Diisostearate	Unichema North America
Prisorine 3792	Polyglycerol-2 diisostearate	Unichema North America
Prisorine 3791	Polyglycerol-2 monoisostearate	Unichema North America
Glucate DO	Methyl glucoside dioleate	Amercol
Glucate SS	Methyl glucoside sesquistearate	Amercol

Estol 3609	Glycerol tri-2-ethylhexanoate	Unichema North America
Dow Corning 556	Phenyl tris(trimethylsiloxy)silane	Dow Corning

Trade Name	Chemical Name	Vender
Ceraphyl 230	Diisopropyl Adipate	ISP Van Dyk Inc
Mineral oil	Hydrocarbon	Witco
Novel II 12-5 Ethoxylate	Ethoxylated alcohol or Branched Guerbent ethoxylate	Condea Vista Company
Cholesterol	Cholesterol	Rita Corporation
Surfactol Q4	Ricinoleamidopropyl dimonium sulfate	CasChem
Westchlor 200 50% w/w	Aluminum chlorohydrate (ACH)	West Wood
Low zirconium penta solution R280-130 40%w/w	Low zirconium: Aluminum Zirconium Pentachlorohydrate	Reheis
Rezal 67 Solution 40%w/w	Aluminum Zirconium Pentachlorohydrate (penta)	Reheis
Westchlor Zr 44 50% w/w	Aluminum Zirconium tetrachlorohydrate (tetra)	West Wood
Westchlor Zr 41 45%w/w	Aluminum Zirconium tetrachlorohydrex-glycine	West Wood

The foregoing description and examples illustrate selected embodiments of the present invention. In light thereof, various modifications would be suggested to one skilled in the art, all of which are within the spirit and scope of this invention.

Claims:

1. A composition which is selected from the group consisting of a microemulsion, a liquid crystal, or a mixture of a microemulsion and a liquid crystal which comprises an antiperspirant salt, a cosmetic oil, and a combination of at least one cationic quaternary surfactant and at least one nonionic surfactant.

2. A composition in accordance with claim 1 characterised in that said antiperspirant salt is selected from the group consisting of aluminum, zirconium and mixed aluminum/zirconium salts.

3. A composition in accordance with claim 1 or 2 characterised in that said antiperspirant salt is a zirconium salt complexed with aluminum salts having coordinated or bound water.

4. A composition in accordance with any preceding claim characterised in that said antiperspirant salt is present in the aqueous phase at from about 1 to about 60%.

5. A composition in accordance with claim 4 characterised in that said antiperspirant salt is present in the aqueous phase at from 10% to about 60%.

6. A composition in accordance with any preceding claim characterised in that said aqueous phase further comprises a buffer, a glycol, a sugar, a cyclodextrin,

a preservative, an antimicrobial, a chelating agent, a water-soluble polymer, an anticholinergic, a monovalent salt, a divalent salt, a trivalent salt, fragrances or mixtures thereof.

7. A composition in accordance with any preceding claim cit said aqueous phase is present at about 1% to about 60%, more preferably at 5% to 30%, and most preferably at 10 to 25%.

8. A composition in accordance with any preceding claim characterised in that said cosmetic oil comprises esters, ethers, long chain alcohols or ethoxylated alcohols, hydrocarbons, fatty acids, monoglycerides, diglycerides triglycerides, fragrances and volatile or non-volatile silicone fluids, and cholesterol.

9. A composition in accordance with claim 8 characterised in that said oil phase comprises silicone fluids which in turn comprise a volatile or non-volatile silicone such as cyclomethicone or dimethicone.

10. A composition in accordance with claim 8 or 9 characterised in that said non-volatile silicone is phenyl tris(trimethylsiloxy)silane.

11. A composition in accordance with claim 8 characterised in that said esters are selected from the group consisting of cetyl octanoate, C12 -15 alcohol benzoate, isostearyl benzoate, diisopropyl adipate and mixtures thereof.

12. A composition in accordance with claim 8 wherein said hydrocarbon fluids are selected from the group such as aliphatic hydrocarbons; hydrogenated polydecenes; hydrogenated polybutenes; dioctylcyclohexane; mineral oil, cyclohexane and mixtures thereof.

13. A composition in accordance with any preceding claim characterised in that the cationic quaternary ammonium surfactant has the following structure:

$$R\text{-}CO\text{-}NH\text{-}(CH_2)_n\text{-}N^+(\text{-}(CH_2)_x\text{-}CH_3)(\text{-}(CH_2)_y\text{-}CH_3)(\text{-}(CH_2)_z\text{-}CH_3)\ A^-$$

wherein n is one to six.

x is zero to three

y is zero to three

z is zero to three

with the proviso that $x+y+z \leq 6$

A^- is any physiologically acceptable counter ion which does not adversely affect the composition, and more specifically A^- can be selected from the group consisting of chloride, bromide, ethosulfate, methyl sulfate, lactate, acetate, nitrate or sulfate.

where R is a ricinoleic derivative:

$CH_3\ (CH_2)_5CH(OH)\ CH_2\text{-}CH{=}CH\text{-}\ (CH_2)_7\text{-}$

Or mixtures thereof.

14. A composition in accordance with claim 13 wherein n=3, x=1, y=0, z=0, A^- = ethosulfate and R = $CH_3\text{-}(CH_2)_5\text{-}CH(OH)\text{-}CH_2\text{-}CH{=}CH\text{-}(CH_2)_7\text{-}$.

15. A composition in accordance with any preceding claim characterised in that said cationic quaternary ammonium surfactant is present at 0.1% to 30%, more preferably at 1% to 30%, most preferably at 2% to 15%.

16. A method for controlling or preventing underarm perspiration and malodor which comprises applying, to an underarm, an effective amount of a composition of claim 1.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/09144

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K7/00 A61K7/32 A61K7/34 A61K7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, EPO-Internal, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 487 887 A (BENFATTO) 30 January 1996 (1996-01-30) cited in the application the whole document	1-10, 13-16
Y	EP 0 278 660 A (STIEFEL LABORATORIES (IRELAND) LIMITED) 17 August 1988 (1988-08-17) page 2, line 36 -page 3, line 47 examples 1-8	1-9,15, 16
Y	WO 97 06777 A (THE MENNEN COMPANY) 27 February 1997 (1997-02-27) examples 10-13	10

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 March 2001	08/03/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Alvarez Alvarez, C

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int. ational Application No
PCT/EP 00/09144

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	SWAFFORD ET AL.: "Characterization of swollen micelles containing linoleic acid in a microemulsion system" J. SOC. COSMET. CHEM., vol. 42, no. 4, 1991, pages 235-247, XP000984183 figure 1 -----	13-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte .ional Application No
PCT/EP 00/09144

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Numéro de publication **0 000 313**
A1

(12) # DEMANDE DE BREVET EUROPEEN

(21) Numéro de dépôt: 78400044.0

(22) Date de dépôt: 30.06.78

(51) Int. Cl.²: F 04 B 9/14, F 04 B 43/02, B 05 B 11/00

(30) Priorité: 01.07.77 FR 7720250

(43) Date de publication de la demande: 10.01.79 Bulletin 79/1

(84) Etats contractants désignés: BE CH DE GB NL

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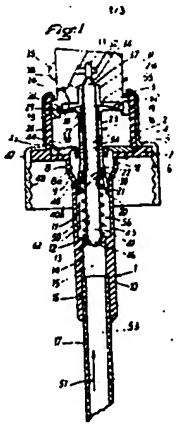
(54) **Pompe à surcompression et diffuseur pour celle-ci.**

(57) Pompe à surcompression et diffuseur pour celle-ci, pour pulvériser du liquide comprenant une coquille (1) ayant une entrée (13) à l'une de ses extrémités et dont l'autre extrémité retient, avec possibilité de déplacement vers l'entrée (13), un diffuseur (28) à orifice (34) obturé par un obturateur (36) se déplaçant, pour l'ouverture, dans la direction de l'entrée (13).

L'orifice (34) débouche dans une première chambre (52) comprise entre le diffuseur (28) et une membrane (24) souple, étanche, qui y est fixée par sa périphérie (25) et qui est solidaire d'un piston (20) qui subdivise l'intérieur de la coquille (1) en un compartiment (65) d'une part, et d'autre part en une seconde chambre (56), dite de compression, ne communiquant pas avec le compartiment (65) mais communiquant avec la première chambre (52) par un passage (38), ce piston (20) étant solidaire de l'obturateur (36) qui obture aussi l'entrée (13) et qui est sollicité vers ladite autre extrémité par un ressort (43) taré de manière que, au-delà d'un seuil de pression donné pour le liquide, la membrane (24) est déplacée vers l'entrée (13) en éloignant l'obturateur (36) de l'orifice (34).



EP 0 000 313 A1

Pompe à surcompression et diffuseur pour celle-ci

La présente invention concerne les pompes et accessoires pour pulvériser du fluide.

L'une de ces pompes, dites à vapo-piston n'a pas une pression de seuil à partir de laquelle commence la pulvérisation. En début et fin d'opération, il sort un mince filet de liquide non pulvérisé.

On a remplacé ces pompes par des pompes dites à précompression dans lesquelles le liquide est précomprimé avant d'être expulsé. Cette précompression est obtenue à l'aide d'un ressort taré agissant sur un clapet. Ce dernier se déplace, pour l'ouverture, dans la direction du jet. Il en résulte que l'on a toujours l'inconvénient précité en fin d'opération.

En revanche, dans les pompes à surcompression auxquelles se réfère la présente invention, le clapet se déplace, pour l'ouverture, en sens inverse de la direction d'expulsion, de sorte que l'on a une pulvérisation uniforme pendant toute l'opération.

Dans cette dernière catégorie de pompe, les doses de liquide pulvérisées sont irrégulières du fait de l'impos-

sibilité du contrôle du mouvement différentiel des pistons, qui sont toujours au moins au nombre de deux, lequel mouvement est fonction de la composante résultant de la force, de la vitesse d'appui et de la force du ressort ; le moyen de réduire les écarts de volumes pulvérisés consiste à renforcer le ressort, or, un ressort trop fort est contre-indiqué pour la facilité de l'utilisation.

D'autre part, ces pompes comportent un nombre important de pièces, ce qui provoque des difficultés de moulage, d'assemblage et affecte le prix de revient. En plus, les pompes à plusieurs pistons augmentent les risques de défauts d'étanchéité ainsi que les frictions des éléments en contact.

La présente invention propose une pompe à surcompression comportant un nombre réduit de pièces et fonctionnant par accumulation du liquide sous pression grandissant dans une chambre extensible axialement.

L'invention, telle qu'elle est caractérisée dans les revendications, remédie aux inconvénients précités.

L'invention vise aussi un diffuseur comme revendiqué à la revendication 9.

Du fait de sa construction, la chambre extensible détermine un déplacement de faible amplitude de l'obturateur (tel que pointeau) autorisant l'expulsion sous pression du liquide, ce qui a pour effet, une plus grande égalité entre les doses, indépendamment de la vitesse d'appui manuelle.

Le ressort assure, en même temps, un appui positif de

l'obturateur sur le siège de soupape dont est muni le diffuseur, rendant de cette façon, étanche la chambre créée entre ledit diffuseur et la face de la membrane.

Il est prévu que le piston, le tube, la membrane et l'anneau de fixation soient conçus en une matière souple telle que le polyéthylène.

L'utilisation d'un seul et unique piston réduit les risques de défaut d'étanchéité, des frictions des éléments en contact et, surtout, permet d'éviter le blocage ou le grippage dus à certains produits utilisés.

L'invention sera mieux comprise grâce à la description donnée ci-dessous à titre nullement limitatif et aux dessins annexés, sur lesquels :

La figure 1 représente une coupe dans un dispositif en phase de "repos" ;

La figure 2 représente une vue en perspective d'un corps extérieur ;

La figure 3 représente une coupe du dispositif en phase "expulsion" ;

La figure 4 représente une coupe dans le diffuseur et la chambre 52 ;

La figure 5 représente une autre forme de réalisation de la membrane ;

La figure 6 représente une variante du dispositif.

Pour une meilleure compréhension de la description, il

faut considérer comme des sous-ensembles les éléments complexes indiqués par les flèches, telles que :

- la flèche 1 pour le corps ou coquille extérieur comprenant la cheminée et tous les secteurs cylindriques coaxiaux ;

- la flèche 28 pour le "diffuseur" et ses détails ;

- la flèche 19 pour le "porte-piston" comprenant le piston, la membrane, l'anneau extérieur et le tube de raccordement ;

- la flèche 36 pour l'"organe intérieur" ou obturateur comprenant les tiges supérieure et inférieure, le moyeu et le pointeau.

Selon l'invention, le corps extérieur 1 est constitué en une matière rigide, telle que polypropylène ou polyéthylène ; il comporte la cheminée 2 munie du côté supérieur d'un rebord 3 orienté intérieurement et la gorge 5 située à la base de l'alésage 4 formant compartiment 65. La cheminée est solidaire de la saillie 6 et de la collerette 7 dont les faces inférieures sont situées dans le même plan.

Le bord inférieur de la saillie 6 est solidaire du secteur cylindrique 8 (alésage 8a) et muni de l'ouverture latérale 18, ledit secteur étant raccordé, à son tour, au secteur cylindrique 10, ceci par l'intermédiaire du secteur tronconique 9.

Le secteur 10 comporte l'alésage 11, à la base duquel se trouve l'épaulement 12 muni en son centre de la lèvre d'étanchéité 13 formant entrée; le même secteur 10

comporte aussi l'alésage 14 formant la cavité 15 et l'alésage 16 dans lequel est placé le tube plongeur 17.

Les alésages 4, 8a, 11, 14 et 16 sont coaxiaux et les secteurs 2, 6, 7, 8 et 10 constituent une seule pièce réalisée en un seul moulage, en une même matière.

Le porte-piston 19 comporte, du côté inférieur, le piston unique 20 muni en son centre de l'alésage 21 reposant sur l'épaulement 22 qui communique avec le canal central 23 du tube 26. Le tube 26 sert d'élément intermédiaire pour raccorder le piston 20 à la membrane 24 et à son anneau de fixation 25 et il est muni aussi, sur sa paroi extérieure, de la rainure verticale 27.

Le diffuseur 28 comporte à sa base une collerette d'un diamètre nettement supérieur 29 et l'alésage axial 58 dans lequel est pratiquée la gorge 30 ; ledit alésage est surplombé par l'alésage coaxial 31, lequel communique avec le gicleur 35 par les canaux 32 et 33, le canal 23 étant muni à sa base du siège de soupape 34.

L'organe central 36 est rendu solidaire du porte-piston 19 ; son moyeu cannelé 39 étant placé dans l'alésage 21 et sa tige 54 -munie de la rainure verticale 38 et du pointeau 37- dans l'alésage 23 du tube 26.

La pompe comprend aussi l'élément 45 muni du joint détanchéité annulaire 44 qui coopère avec la face extérieure du tube 26, cet élément étant placé par encliquetage dans la gorge 5 dont est pourvu l'alésage 4.

Pour la facilité du montage, la cheminée 2 et son rebord 3 sont rendus élastiques par les fentes 2a, 2b, 2c, 2d et 2f (figure 2).

Par l'assemblage du porte-piston 19, grâce à l'anneau 25 dans la gorge 30 du diffuseur 28 et de l'organe central 36 dans les alésages 21 et 23, tous ces éléments sont rendus solidaires et sont maintenus en position "haut" par le ressort de rappel 43.

En même temps et par le même assemblage, est constituée la cavité 52 délimitée entre l'épaulement 55 de l'alésage 58 et la face supérieure de la membrane 24, laquelle cavité est rendue étanche grâce au pointeau 37 et à l'anneau de fixation 25 dans le diffuseur 28.

L'ensemble est coiffé du manchon 47 muni du filetage intérieur 48. Le compartiment 65 ne communique pas avec les chambres 52 et 56.

Dans le but d'avoir une décompression dans le cylindre 56, en vue d'un amorçage rapide, selon une deuxième forme de réalisation, la tige 41 est munie du côté intérieur d'au moins une encoche 62 de faible hauteur axiale permettant à l'air comprimé de s'échapper vers l'intérieur du récipient.

A la figure 6, pour faciliter la réalisation d'un piston 63 à double lèvres, il est prévu que le piston puisse être emmanché sur la tige 23 de membrane 24 et, dans ce cas, la mise sous pression atmosphérique du récipient contenant le liquide s'effectue par une ouverture 64 latérale dans la paroi mince 11 du cylindre 1, cette ouverture étant située entre les lèvres du piston. De ce fait, le joint central 44 n'est plus nécessaire, et le nombre des pièces reste identique à celui de la variante précédente.

FONCTIONNEMENT

En position "repos", la pression du ressort 43 s'exerce

sur la face inférieure du moyeu 39 qui transmet, par l'épaulement 22, le déplacement vertical au porte-piston 19 et, donc, au piston 20.

Par la même action, le pointeau 37 prend appui sur le siège de soupape 34 dont est muni le diffuseur 28, lui imprimant aussi un déplacement jusqu'à ce que la collerette 29 bute sur les rebords 3 dont est muni chaque secteur de la cheminée 2 en même temps, la coopération entre le pointeau 37 et le siège de soupape 34 rend étanche la chambre 52.

Lors du tout premier appui sur le diffuseur 28, on comprime l'air se trouvant dans la chambre 56 et, lorsque l'encoche 62 de l'obturateur 41 passe devant la lèvre 13, cet air est chassé vers le bas à l'intérieur du récipient. Lorsque l'on cesse d'appuyer sur le diffuseur 28, du fluide passe du récipient dans la chambre 56.

En position "repos", c'est-à-dire lorsque l'on n'appuie pas sur le diffuseur, l'extrémité tronconique 46 de la tige 41 est dégagée légèrement par rapport à la lèvre centrale d'étanchéité 13, autorisant le liquide 53 (flèche 51) à accéder dans la chambre de compression 56, ceci, sous l'effet d'aspiration dû au déplacement du piston 20.

Pendant cette phase d'aspiration, l'étanchéité de la chambre 52 est réalisée par le pointeau 37 de façon positive, sous la double action d'élasticité, d'une part, de la membrane 24 et, d'autre part, du ressort 43.

En position de "repos", l'étanchéité du récipient est assurée par le joint fixe 44 qui agit sur la face exté-

térieure du cylindre 26.

En exerçant une pression (flèche 57, figure 3) sur le diffuseur 28, on déclenche, en cascade, les actions suivantes :

1°) la fermeture de la chambre de compression 56 due à la coopération entre la tige inférieure 41 et la lèvre 13 ;

2°) la compression progressive du ressort 43 ;

3°) on maintient l'étanchéité de la chambre 52 par la pression accrue du pointeau 37 sur le siège 34 ;

4°) on comprime le liquide enfermé dans la chambre de compression 56, par le déplacement de l'obturateur qui entraîne le piston 20. Le liquide est refoulé par les rainures 40, 40a et 38 dans la chambre 52 ;

5°) on y accumule le liquide qui monte en pression jusqu'à ce que la pression du liquide dans la chambre 52 soit supérieure à la somme des résistances de la membrane 24 et du ressort 43, de sorte que la membrane se déplace vers le bas (flèche 59, figure 3) en sens opposé par rapport au siège de la soupape 34 ; de ce fait, la membrane 24 entraîne le pointeau 37 avec lequel elle est solidaire, autorisant le liquide à accéder sous pression au gicleur 35 par les canaux 32, 33.

La mise sous pression atmosphérique du liquide s'effectue à chaque passage de l'encoche 27 dont est muni le cylindre 26, à travers le joint 44 qui fait ainsi un double office.

Plus précisément, l'expulsion sous pression du liquide accumulé s'effectue simultanément avec un mouvement relatif entre le piston 20 et le diffuseur 28 -tout en restant solidaires, l'un par rapport à l'autre-, ce mouvement étant de faible amplitude et opposé à la direction de l'appui 57.

Le logement 15 sert comme réservoir pour le débattement de la tige 41 en position basse.

La figure 4 représente une coupe où l'on peut voir le déplacement de la membrane 24 et du pointeau 37 (flèche 61) et le recul du même pointeau (amplitude 60).

La figure 5 représente une autre forme de réalisation de la membrane pour augmenter sa surface et, implicitement, sa souplesse.

Revendications de brevet

1. Pompe pour pulvériser du liquide comprenant une coquille (1) ayant une entrée (13) à l'une de ses extrémités et dont l'autre extrémité retient, avec possibilité de déplacement vers l'entrée (13), un diffuseur (28) à orifice (34) obturé par un obturateur (36) se déplaçant, pour l'ouverture, dans la direction de l'entrée (13), caractérisée en ce que l'orifice (34) débouche dans une première chambre (52) comprise entre le diffuseur (28) et une membrane (24) souple, étanche, qui y est fixée par sa périphérie (25) et qui est solidaire d'un piston (20) qui subdivise l'intérieur de la coquille (1) en un compartiment (65) d'une part, et d'autre part en une seconde chambre (56), dite de compression, ne communiquant pas avec le compartiment (65) mais communiquant avec la première chambre (52) par un passage (38), ce piston (20) étant solidaire de l'obturateur (36) qui obture aussi l'entrée (13) et qui est sollicité vers ladite autre extrémité par un ressort (43) taré de manière que, au-delà d'un seuil de pression donné pour le liquide, la membrane (24) est déplacée vers l'entrée (13) en éloignant l'obturateur (36) de l'orifice (34).

2. Pompe suivant la revendication 1, caractérisée en ce que, suivant un plan perpendiculaire au sens de déplacement, la section droite de la seconde chambre (56) est plus petite que celle de la première chambre (52).

3. Pompe suivant la revendication 1, caractérisée en ce que la coquille (1) forme une cheminée (2) assouplie par des fentes (2a) à (2f) de réception du diffuseur (28).

4. Pompe suivant la revendication 1, caractérisée en ce que le passage (38) est constitué par une rainure le

long d'une génératrice de l'obturateur (36).

5. Pompe suivant la revendication 1, caractérisée en ce que la face latérale du piston porte une rainure (27) conique.

6. Pompe suivant la revendication 1, caractérisée en ce que l'obturateur (36) est solidarisé au piston (20) à l'aide d'un moyeu (39) cannelé sur lequel prend appui le ressort (43).

7. Pompe suivant la revendication 5, caractérisée par un joint (44) annulaire fixé sur la coquille (1) et en contact de glissement avec la face latérale du piston (20) dans laquelle est ménagée la rainure (27) conique.

8. Pompe suivant la revendication 1, caractérisée par une encoche (62) ménagée dans la face latérale inférieure (41) de l'obturateur (36).

9. Diffuseur pour pulvériser du liquide comprenant un corps traversé par un passage, caractérisé en ce qu'une membrane souple est fixée par son bord au corps autour de l'embouchure du passage qui forme siège pour un obturateur.

Fig:1

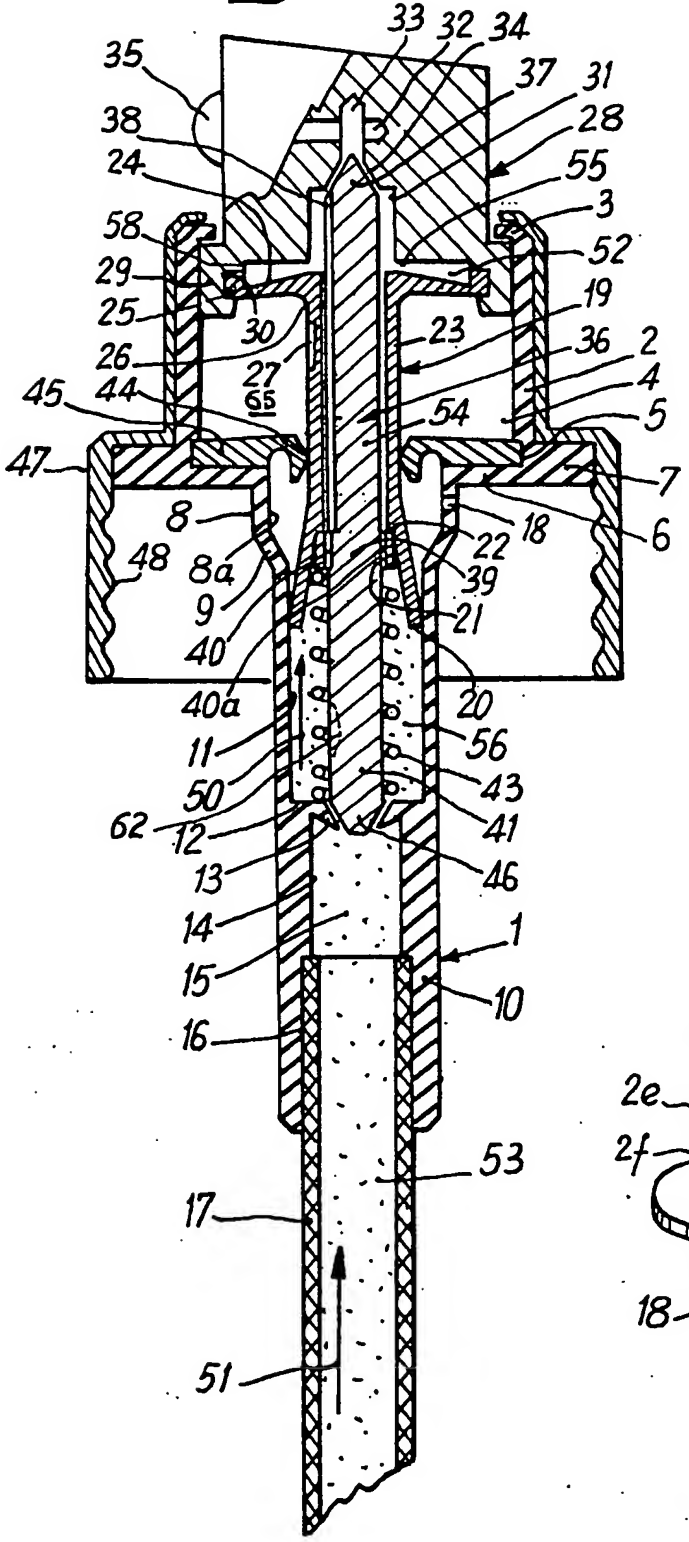

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Fig:2

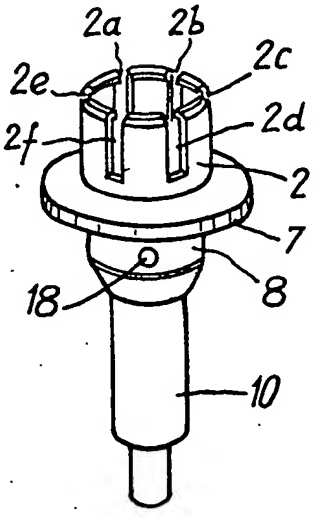
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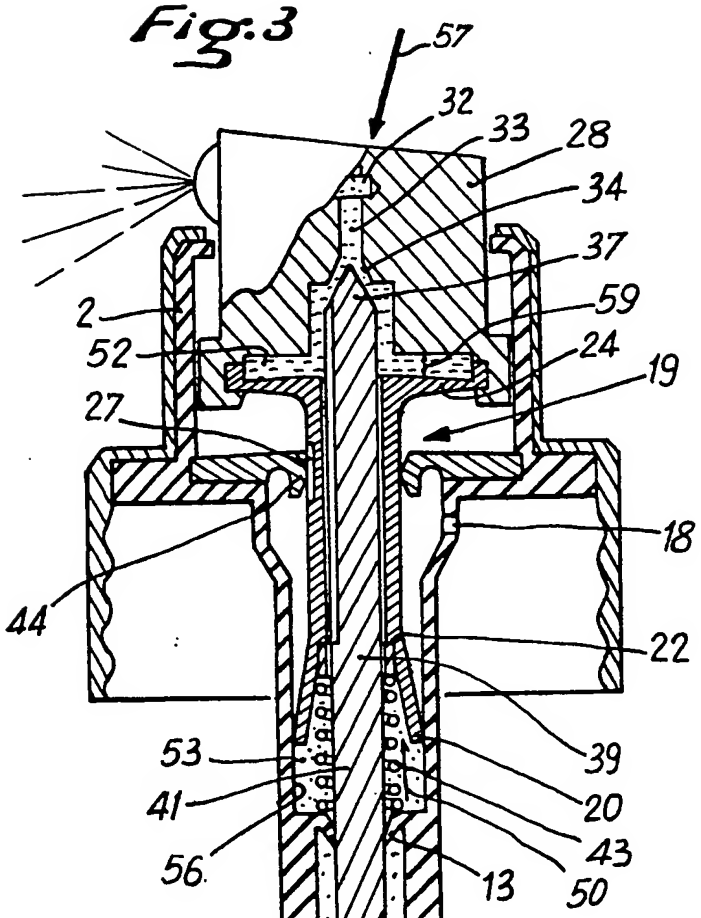
Fig:3



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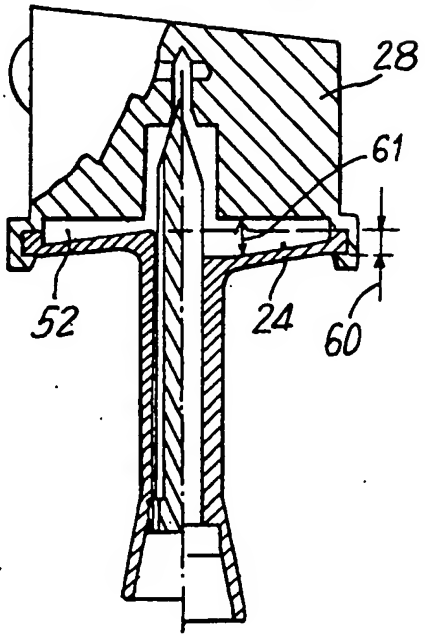
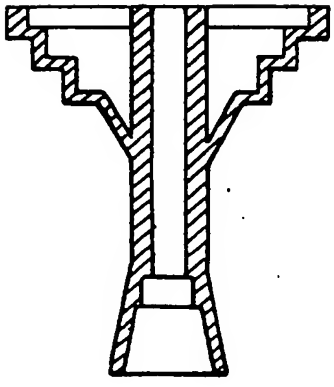


Fig:5



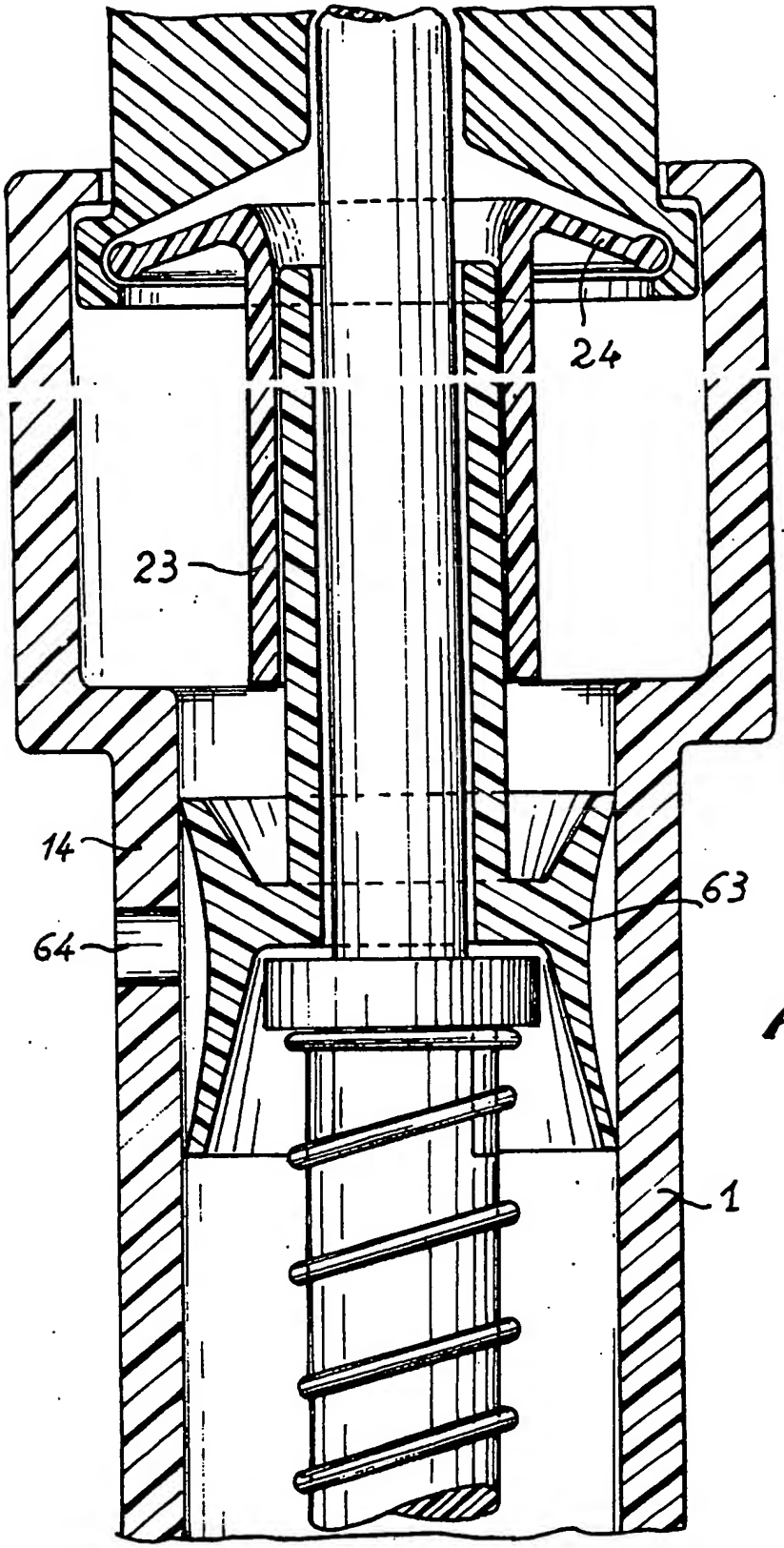


Fig. 6

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Numéro de la demande

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EP 78 40 0044

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée
	FR - A - 2 251 379 (YOSHINO KOGYOSHO) * Figures 1 à 11; diffuseur (21); piston (13,14,16); revendications 1 à 10 *	1,2,6
	FR - A - 2 249 716 (YOSHINO KOGYOSHO) * Figures 1 à 7; élément (28); page 5, lignes 5 à 11 *	1,8
	FR - A - 2 305 241 (S.T.E.P.) * Figures 5,6; page 4, lignes 12 à 27 *	1
	GB - A - 1 187 099 (VAPORISATEURS MARCEL FRANCK) * Figures 1,2,7; corp (14) *	1,3
	US - A - 2 889 964 (COOPRIDER) * Figures 1 à 5; revendication 1 *	3
	US - A - 4 029 261 (OLEGNOWICZ) * Figure 2; rainure (47) *	4
	US - A - 3 991 914 (KOTUBY) * Figures 1 à 3; colonne 4, lignes 29 à 44 *	5,7
	FR - A - 1 339 657 (LES VAPORISATEURS MARCEL FRANCK) * Figure 1; résumé *	1,9

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CLASSEMENT DE LA DEMANDE (Int. Cl.³)

F 04 B 9/14
F 04 B 43/02
B 05 B 11/00

DOMAINES TECHNIQUES RECHERCHES (Int. Cl.³)

F 04 B 9/14
F 04 B 21/04
F 04 B 43/02
B 05 B 11/00
A 61 M 11/00
G 01 F 11/02

CATEGORIE DES DOCUMENTS CITES

X: particulièrement pertinent
A: arrière-plan technologique
O: divulgation non-écrite
P: document intercalaire
T: théorie ou principe à la base de l'invention
E: demande faisant interférence
D: document cité dans la demande
L: document cité pour d'autres raisons

&: membre de la même famille, document correspondant

X Le présent rapport de recherche a été établi pour toutes les revendications

Lieu de la recherche	Date d'achèvement de la recherche	Examinateur
La Haye	05-10-1978	ANDRIES

Office européen des brevets

RAPPORT DE RECHERCHE EUROPEENNE

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EP 78 40 0044

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée
PE	FR - A - 2 349 749 (EMSON RESEARCH) * Figures 1, 3 à 5; revendications 1 à 32 *	1,4,5,7
PE	FR - A - 2 344 339 (COSTER TECHNOLOGIE SPECIALI) * Figures 1 et 2; revendications 1 à 3 *	1
A	GB - A - 1 083 781 (DECAUX) * Figure 1; corp (1) *	1
A	FR - A - 2 177 375 (THE AFA CORP) * Figures 1 à 3; corp (22) *	1
A	FR - A - 1 554 126 (DIAMOND INTERNATIONAL CORP) * Figure 1; élément (24-70-68) *	1

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DOMAINES TECHNIQUES RECHERCHES (Int. Cl.³)